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ABSTRACT

A "troubleshooting" model was designed to aid individual teachers in solving behavioral problems in the classroom. The model focused on student behavior for problem identification; on teacher behavior for causal analysis; and on teacher behavior for solution proposals. To examine how readily the model can be understood, applied, and integrated into teachers' existing ways of identifying and solving classroom problems, two questions were addressed: (1) How readily do teachers learn the components of a troubleshooting model via a guided design approach? and (2) Is the language used by the model consistent with the language used by teachers? Forty-five teachers, first individually and then in groups, identified problems they perceived in a transcript of a high school mathematics class. While the group exercise was seen as an effective tool for having teachers explore the troubleshooting model, data obtained dealt only with how teachers modify attention to teacher and student behavior within the context of a given classroom problem. Appendices include a descriptive summary of participant characteristics, a sample of the exercise used in testing the model, and before-and-after differences in participants' attitudes toward solving classroom problems. (JD)

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Testing the Classroom Troubleshooting Model

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1. What's the Problem?

Needs assessment is generally regarded as a process for determining gaps between what is and what ought to be, ranking the gaps, and deciding which gaps should be closed. Most of the models available in educational literature (e.g. Briggs, 1977) apply this process on a large scale such that the decision making process is conducted by one or more groups and organized to provide a wide base of input. The literature in business and industry, on the other hand, provides alternatives that may be more readily used by the individual (Harless, 1975; Mager, 1970). Drawing from the work of Harless and Mager, Tillman (1982) has developed a needs assessment model, which he calls a "troubleshooting" model, applicable by individual teachers for solving problems. The model was developed over a five-year period of working directly with field-based sections of educational psychology students, with teachers, and with school personnel assigned to help remediate teaching problems.

With the development phase of building the troubleshooting model now complete, this paper initiates a look at how readily the model can be understood, applied, and integrated into teachers' existing ways of identifying and solving classroom problems.

2. What's the Purpose of the Study?

Clark and Yinger (1979) have identified a new dimension in research on teaching. This new approach is based on the assumption that an understanding of teachers' cognitive processes is essential to the understanding of what teachers do in their classrooms. Specifically, they suggest that:

> The study of the thinking processes of teachers - how they gather, organize, interpret, and evaluate information - is expected to lead to understandings of the uniquely human processes that guide and determine their behavior (p. 231).

Clark and Yinger caution, however, that if the results of such studies are to be applied in classrooms, adaptations or translations must be made. This study is concerned with the latter issue - how to adapt or "engineer" ideas from the needs assessment literature so that teachers may use these techniques, or modify them for use, in order to solve specific teaching problems. The purpose of this study, then, is to address two issues:

1) How readily do teachers learn the components of a trouble-shooting model via a guided design approach?

2) Is the language used by the model consistent with the language used by teachers?

3. Who Were the Participants?

Forty-five practicing teachers enrolled in introductory graduate level courses in instructional supervision participated in this study. Descriptive data on this group are shown in Appendix A. Highlights from frequency distributions indicate that a typical participant was a female between 26 to 35 years old and had been teaching in an elementary school for six to ten years. In fact, 82% of the group had five years or more of teaching experience.

4. What Did We Do?

A. Within the context of a regular graduate level course in instructional supervision, students were first presented with a transcript of the interaction in a high school mathematics class, and were asked (1) to individually identify in writing

any problems they perceived occurring in the class as described, (2) to suggest possible causes of the problems, and (3) to propose solutions.

B. Participants next were assigned to groups of three or four members and were asked to discuss the problems they identified and to develop a group response. Each group then received written feedback in the form of responses developed by other groups to the same task. The feedback was immediately followed by a brief transcript relating the approach to the task taken by an exemplary group. This same procedure of group discussion, feedback, and instruction was then repeated as well for the causes and solutions that the students initially proposed. The intent was to guide the participants' thinking toward a clear understanding of the classroom troubleshooting model. This particular form of instruction is referred to as "Guided Design" and has been described by Wales and Stager (1978). Sample sheets from this exercise are given in Appendix B.

C. Several types of data were obtained. First, written individual comments prior to group instruction were collected on problems, causes, and solutions related to the transcript of the high school math class. Second, group responses prior to and after instruction were collected on problems and causes related to the same high school transcript. Comments regarding solutions were obtained after instruction only.

D. Data obtained on every problem, cause, and solution were classified according to focus - teacher or student - and to degree

of specificity - behaviorally oriented or broad. Inspection of these classifications indicates whether the obtained data conformed to model requirements. In general, "model requirements" suggest a focus on student behavior for problem identification, a focus on teacher behavior for causal analysis, and a focus on teacher behavior for solution proposals.

5. What Did We Predict?

   A. Problem Phase. The following predictions were made in regard to differences before and after instruction for the group exercise:

      (1) Decrease in attention to teacher behavior.

      (2) Increase in attention to student behavior.

      (3) Decrease in broad, descriptive language.

      (4) Increase in specific, behavioral language.

   B. Cause Phase. The following predictions were made in regard to differences before and after instruction for the group exercise.

      (5) Increase in attention to teacher behavior.

      (6) Decrease in attention to student behavior.

      (7) Decrease in broad, descriptive language.

      (8) Increase in specific, behavioral language.

   C. Solution Phase. The following predictions were made in regard to differences among individuals prior to the group exercise and to differences after instruction for the group exercise.

      (9) Prior to instruction, solution statements made by individuals will already focus more on teacher actions than student actions.

(10) Prior to instruction, teacher-broad statements made by individuals will be greater than teacher-specific statements.

(11) After group instruction, teacher-specific statements will be greater than teacher-broad statements.

The responses to all queries were open ended.

6. What Results Were Obtained?

Using t-tests for related groups, the following results were obtained for each of the above predictions:

Prediction	Confirmed via t-test
Problem Phase	
(1)	No
(2)	Yes
(3)	Yes
(4)	Yes
Cause Phase	
(5)	No
(6)	Insufficient data
(7)	Yes
(8)	No
Solution Phase	
(9)	Insufficient data, though confirmed via inspection.
(10)	No
(11)	NO

Actual t values and means may be found in Appendix C.

7. What Would We Conclude from these Results?

The group excerise was found to be an effective tool for having students explore the troubleshooting model. During the problem phase, students tended to focus their attention on the teacher and do so in broad statements. After instruction, however, their responses were increasingly focused on student behavior. During the cause phase, students focused already on teacher behavior and in specific terms. No significant increase in these two trends were found. Decreases in broad, descriptive statements did, however, occur. During the solution phase, students focused very directly on teacher behavior. In fact, individuals prior to the group exercise were similarly attentive to teacher behavior. In sum, where there were initial discrepencies between the model and student responses, the group exercise was effective in closing the gap.

These data deal only with how students modify attention to teacher and student behavior within the context of a given classroom problem. It does not provide data on how well they might use these new approaches in other classroom situations or in their own. In other words, they did readily learn the model language but would they use it in other situations, particularly their own classrooms?

Finally, we sought to confirm the relationships between teacher and student behavior called for in the model with teaching experience for this particular group of teachers. We expected correlations between number of years teacher experience with the number of statements that specified (a) student related problems, (b) teacher related causes, and (c) teacher directed solutions. Only in case "(b)" did we obtain a significant correlation ($r = -.33$, $p < .05$). Apparently, with increasing

experience, teachers tend to rule themselves (or other teachers) out as possible causes of problems.

Future work will focus more directly on the use of the troubleshooting model for effecting change within the individual teacher's classroom.

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Appendix A

Descriptive Summary

Category	Number	Percent
Sex		
Male	16	36
Female	28	64
Age		
20-25	1	2
26-35	25	57
36-45	16	36
46-65	2	5
Years Teaching Experience		
0-5	8	18
6-10	22	50
11-15	9	20
16-20	4	9
21-25	1	2
Years Administrative Experience		
0	26	59
1-5	15	34
5-10	3	7
Current Position		
Teacher	21	48
Administrator	12	27
Other	11	25

Category	Number	Percent
Grade Level		
Elementary	19	43
Middle School	4	9
High School	9	20
Other	12	27
Reaction to Supervision		
Negative	4	9
Neutral	15	34
Positive	25	57

Appendix B

SECOND EXERCISE - GROUP DECISION-MAKING
Form groups of three to four people.

Introduction

The material you are about to receive is organized in an "Instruction - Feedback" pattern. The "Instruction" section presents an issue or problem that your group is to consider. The "Feedback" section provides a summary of the issues or response by other persons to the same problem. The purpose of the Feedback is to give everyone the opportunity to compare their conclusions with those of other people. Do not feel that you have to accept their views or change any of your decisions.

Appoint a secretary to record the decisions of the group. When you finish the task posed by the Instruction, pick up a copy of the Feedback and next Instruction. If you run into any problems, call the teacher.

Instruction A - The Problem Is...What's the Problem?

Each member of your consultant team has individually reviewed the information received on Ms. Wiggins' classroom situation.

Your task as a team is to identify the problems. Discuss what the problems are. Have the secretary record the group's responses.

Feedback A

How do teachers react to this task? In different ways as you will see. Here are two examples that are fairly representative of those received from teachers and graduate students.

(a) Describe the problems, as you see it, with Ms. Wiggins' class.

Sherry C.'s comments

Ms. Wiggins just has no control over her class. It looks like the class is controlling her rather than the other way around. She needs to put her foot down and say to the class, "These are my rules." Students should know that if they don't follow the rules some form of disciplinary action will follow.

Gil J.'s comments

Students are completely uninterested in what's going on. They seem unmotivated, bored and ready to avoid as much work as they can. There is almost no discipline. Students take advantage of their freedom by asking to leave the class or just making irrelevant comments. Ms. Wiggins doesn't treat students the same way. She put Martin down when he couldn't do the work but lets Pete linger around his desk.

Instruction B - Will the Real Problem(s) Please Stand Up?

Phil J. listened intently to comments made by Sherry and Gil. "I'm somewhat confused by your comments. You're calling everything a problem. Problems are suppose to identify gaps between what is and what should be. I think that the major problem should be defined in terms of learner behavior."

The others agreed and re-examined their problem statements. They decided to describe first the situation and second the behavior of the students within that situation.

Using the same format for describing a problem, identify the major problems in Ms. Wiggins' classroom.

Feedback B

Here is the following list of problem statements generated by teachers and graduate students.

Problem Indicators in Ms. Wiggins' Classroom

1. When Ms. Wiggins asks for volunteers to put the homework assignment on the board, (a) Bobo says he didn't understand what to do, (b) Pete is dozing, (c) an anonymous contributor calls out, (d) Martin says he didn't understand what to do, (e) Lucy asks permission to leave the class, (f) Pete reads a note.

2. While four students are writing their problems out on the board, (a) Roy and Dexter whipser about the latest drag strip results, (b) Bill listens to a transistor radio, (c) Roy and Dexter swap racing car pictures.

3. When Ms. Wiggins begins to address the class, Lucy interrupts with a request to speak to Pete.

4. As Lucy leaves the room, Bobo and Lucy exchange insults.

5. When Ms. Wiggins asks Bill a specific question, Bill does not respond and continues to listen to his radio.

Notice that each of the five problem indicators begins with a situation and the identifies instances of individual student behavior.

Instruction C - Describe the Possible Causes...What Done It?

Now that the problems have been clearly identified, what do you think is the origin of the problems within the boundary of the classroom?

Discuss what the possible causes are. Again, have the secretary record the group's responses.

Appendix C

Differences Among Types of Problems
Identified Before and After Instruction

Variable	Pre-Instruction Mean	Post-Instruction Mean	t Value
Teacher Behaviors (specific and broad)	2.92	1.54	1.68
Student Behaviors (specific and broad)	1.69	4.15	2.29*
Specific Behaviors (teacher and student)	1.15	3.31	1.93*
Broad Behaviors (teacher and student)	3.62	2.38	1.85*

* $p < .05$ for one tailed test

Differences Among Types of Causes
Identified Before and After Instruction

Variable	Pre-Instruction Mean	Post-Instruction Mean	t Value
Teacher Behaviors (specific and broad)	2.85	4.07	1.43
Student Behaviors (specific and broad)	insufficient data		
Specific Behaviors (teacher and student)	.62	2.38	2.07*
Broad Behaviors (teacher and student)	3.00	2.38	.84

* $p < .05$ for one tailed test

Specific and Broad Teacher-Focused Solutions
Identifed Before and After Instruction

Variable	Specific Teacher Mean	Broad Teacher Mean	t Value	Significance <.05
Pre-Instruction (individual)	1.91	1.59	.38	N.S.
Post-Instruction (group)	3.15	2.46	.65	N.S.

Relation Between Years Experience Teaching
and Number of Correctly Focused Problems, Causes,
and Solutions Identified Before Instruction

Variable	Mean	r	Significance < .05
Student-Focused Problem	1.61	.06	N.S.
Teacher-Focused Cause	2.64	-.33	*
Teacher-Focused Solution	3.66	.09	N.S.